Campbell 248

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THE

FLUX-MOTOR;

OR,

THE TIDE

EMPLOYED AS A MOTIVE POWER

AT ANY DISTANCE FROM THE SEA.

BY

FERDINANDO TOMMASI.

THE MODEL OF THIS APPARATUS (SCALE $\frac{1}{4}$TH) WORKING DAILY AT THE INTERNATIONAL EXHIBITION.

(INVENTION PATENTED IN ENGLAND, FRANCE, ETC., ETC.)

London:

PRINTED BY GILBERT & RIVINGTON,

52, ST. JOHN'S SQUARE, AND 28, WHITEFRIARS STREET, E.C.

1871.

Price Fourpence.

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THE MODEL OF THIS APPARATUS (SCALE $\frac{1}{3}$TH) WORKING DAILY AT THE INTERNATIONAL EXHIBITION.

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THE FLUX-MOTOR:

PRINCIPLE—APPLICATION—DESCRIPTION—UTILITY.

The power of the Flux-motor consists in the tension and rarefaction of the air produced, by the weight of the water of the sea raised by the tide, in a recipient having two divisions or compartments communicating with the sea.

The compressed air acts upon an apparatus motor with the same degree of power as steam does, provided it be at an equal tension; and the rarefied air, by permitting the exterior air to exercise a pressure proportionate to its rarefaction, enables it also, in its turn, to act on the aforesaid apparatus with an equal degree of power.

The flux-motor is essentially composed:

1st. Of a reservoir, by which the power is produced, which is to the flux-motors what the boiler and its accessories are to steam-engines.

2ndly. Of a motive apparatus, constructed, with some slight modifications, on the principle of a stationary steam-engine.

The reservoir is divided into two compartments or divisions, G and F. Its lower base is below the level of an average low tide at the syzygies A; its upper base, in its vertical part, reaches the same level as the average high tides at the syzygies C, and its horizontal division M corresponds at the point which serves as a base at the *unit of height* B.

In order to produce the various results of which we have spoken, the reservoir must necessarily be entirely buried in the sand, and consequently sheltered from the waves and storms.

This reservoir may be constructed either of masonry, hydraulic mortar, cast-iron, or iron-plates, and may be of any form, and at any distance from the sea, provided that it is placed at the aforesaid levels, and that the communicating tube D is proportionally prolonged.

As soon as the sea reaches the point B, the air contained in the compartment F, not being able to find an outlet either by the tube H, whose orifice is submerged, or by the tube I, whose cock is closed, is compressed to a degree of tension proportionate to the weight of the sea-water. By putting, then, this compressed air into communication with the *feeding tube* of an apparatus similar to a steam-engine, and constructed in due proportion, both as regards the above tension and the amount of work which it is desired to obtain, the apparatus will be put in movement, and will continue to work till the fall of the tide, i. e. during a period of about three hours. During this time the water which penetrates freely by the tube H into the compartment G (the tube K being in communi-

cation with the exterior air) fills the said compartment to a level corresponding with the level of the sea. The cock of the tube K is then closed, by which means the water in the compartment G is prevented from escaping. As soon as the sea descends to the point B, the water, which remains as it were suspended in the compartment G, rarefies, by its weight, the air which is found between it and the motive apparatus; from which it results that, by putting in communication the *feeding tube* of the apparatus with exterior air and its *discharging tube* with the tube K, the weight of the exterior air bearing upon the piston of the motive apparatus will be more or less considerable, according to the degree of rarefaction of the air in the tube K. This rarefaction being proportionate to the weight represented by the height of the water in the compartment G, and the height being the same as that of the water which, a short time before, exercised its pressure (at the rising tide), the pressure of the exterior air on the piston, and consequently the degree of work which results from it, will be the same as that of the compressed air, and will continue so till the end of the reflux, i. e. for about three hours.

By the above means it would be possible to obtain, perpetually, about three hours of work and three hours of rest.

For those branches of industry to which this intermittent work is not adapted, it would be necessary to construct a motive apparatus, with two cylinders at right angles, to which would be added a certain number of pumps worked directly by its piston motors O and P, and the tides which occur during the night and on Sundays

would be utilized, and be made to compress, by means of the said pumps, the largest possible quantity of air, and force it into the recipient N, which is in reality nothing but the underground part of the factory, and which takes the name of the *reserve compartment*. Whenever it is desired that the motive apparatus should exercise its power during the three hours of rest above mentioned, it will only be necessary to take away from the apparatus a cylinder and all its pumps, and put it in communication with the reserve compartment, the compressed air of which will furnish the requisite power.

As the tubes K and I may be indefinitely prolonged, the work to be obtained from the tides may be produced at any distance from the sea.

Should a company, formed *ad hoc*, undertake the expenses of instalment, and let out to manufacturers the motive force, at so much the cubic metre, in the same way as is done with the gas [1], the manufacturers would be saved the enormous expense of boilers, which have to be renewed every ten years, the insurance premium, both against fire and explosion, the wages of the mechanics and stokers, the cost of coal, which will necessarily become dearer in proportion as the mines become exhausted, and they will have to pay only for the motive force of which they have made effective use.

The cost of this motive force would be very moderate,

[1] The company, in this case, would send to the different factories the compressed air contained in a special reserve compartment, which would be constantly kept filled by means of pumps worked by the apparatus and flux-motors of the company.

as, the flux-motors once established, their maintenance would be essentially gratuitous.

The motive force of the flux-motor may be applied to all kinds of industry, even to those where, on account of the inflammable nature of the substance to be worked, it is impossible to use steam. It is not affected by atmospheric variations, such as arise from decrease of water in rivers and waterfalls, and, moreover, it can never fail in its effects.

It is, then, useless to enlarge upon the advantages to be derived from the use of the flux-motor, and upon the important part it is destined to play in commerce and in industrial pursuits.

Explanation of the letters contained in the plate representing a section of the sea, shore, reservoir, and reserve compartment.

A. Level of average low tides during the syzygies.

B. Level of the point which serves as a base of the *unit of height.*

C. Level of average high tides during the syzygies.

D. Tube of communication between the reservoir and the sea.

E. Reservoir.

F. Lower compartment.

G. Upper compartment.

H. Tube of communication between the upper compartment and the sea.

I. Tube of communication between the lower compartment and the *feeding tube* of the motor apparatus.

K. Tube of communication between the upper compartment and the discharge tube of the same apparatus.

L. Factory.

M. Horizontal division.

N. Reserve compartment.

O. Cylinder, with piston of the motor apparatus.

P. Pump for compressing the air.

Q. Valve.

R. Cocks.

S. The shore.

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